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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,489	09/02/2003	In-Su Hwang	1349.1259	2307

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EXAMINER

MRUK, GEOFFREY S

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 06/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/652,489

Applicant(s)

HWANG, IN-SU

Examiner

Geoffrey Mruk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebinuma et al. (US 4,610,202) in view of Chuang et al. (US 5,708,957).

With respect to claim 1, the primary reference of Ebinuma discloses an ink-detecting device (Fig. 2) of an inkjet printer (Fig. 1), to detect an ink level and to detect when the ink level decreases below a predetermined level, (Column 3, lines 28-32) comprising:

- an ink tank (Fig. 2, element 30) comprising a predetermined amount of ink;
- a supporting member (Fig. 2, element 36) disposed to protrude inward (Fig. 3B), an interior surface of the ink tank;
- a luminous member (Fig. 3, element 38, Column 3, lines 31-32) comprising a self-luminous material and supported by the supporting member, and
- a photo detector (Fig. 3, element 38) to detect a light (Column 3, lines 31-32, i.e. photocoupler) emitted from the luminous member when the ink level in the ink tank is lower than the predetermined level (Column 3, lines 50-53).

With respect to claim 2, the primary reference of Ebinuma discloses a transparent window (Column 3, lines 50-53) disposed at a corresponding position of the supporting

member (Fig. 2, element 36) to pass the light from the luminous member (Fig. 3, element 34), wherein the photo detector detects the light passed through the transparent window (Column 3, lines 50-53).

With respect to claim 5, the primary reference of Ebinuma discloses the supporting member (Fig. 2, element 36) is disposed at a sidewall (Column 3, lines 36-39) of the ink tank (Fig. 3, element 30).

With respect to claim 6, the primary reference of Ebinuma discloses the supporting member (Fig. 2, element 36) is disposed at a bottom (Column 3, lines 36-39, i.e. outer walls) of the ink tank (Fig. 3, element 30).

However, Ebinuma fails to teach the luminous member being capable of emitting light without using a powered light source.

The secondary reference of Chuang discloses "an optical sensor is provided with a self-powered light source by the use of a radio luminescent material which includes a radioactive beta emitter constituent and a phosphor constituent energized by beta particles from the radioactive constituent to emit light. By appropriate selection of the phosphor compound, the wavelength of light produced by the radio luminescent source may be matched to a corresponding sensing matrix to optimally configure the sensor for the detection of a particular substance of interest" (Column 2, lines 29-39). Figure 1 illustrates the optical system where "A test medium enters test cell 40 along a pathway indicated by arrow 46 and exits the pathway along arrow 48. Test cell wall 42 is configured to permit the transmission of light from optical filter 34 there through. Light also passes through space 45 containing the test medium before encountering sensing

matrix 50. For this configuration, the test medium is a gas or liquid, which permits the transmission of light there through" (Column 3, lines 64-67; Column 4, lines 1-2) and the "Sensing matrix 50 produces an optical characteristic which varies with the presence of a selected substance in test cell 50. This varying optical characteristic is represented by arrows 58 and is detected by photo detector 60 through optical filter 64" (Column 4, lines 22-26).

Therefore, in view of the teachings of the secondary reference, one of ordinary skill in the art would have been motivated to modify the primary reference by using the self-powered light source of Chuang in the liquid level detecting mechanism of Ebinuma. The motivation for doing so would have been "Luminophore-based sensors typically use a LED or lamp as a light source, requiring an external power supply which can add noise and variability to sensor operation due to variations in the supply power. Where the power supply has a limited life, such as when batteries are used as the power source, the operation of the sensor is limited by the operational lifetime of the power supply" (Column 1, lines 60-66).

2. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebinuma et al. (US 4,610,202) in view of Chuang et al. (US 5,708,957) as applied to claims 1, 2, 5, and 6 above, and further in view of Kitagawa et al. (US 6,264,855 B1).

Ebinuma and Chuang references disclose all of the limitations of the ink-detecting device of an inkjet printer except:

- the luminous member is a luminous paper and
- the luminous member is a luminous paint.

Kitagawa discloses a water resistant luminous pigment where "this pigment is homogeneously dispersed in each kind of ink vehicle, paint vehicle or the like to give a luminous ink or a luminous paint. Using this ink or paint, luminous patterns, letters, figures or the like can be formed or further a luminous paint membrane can be applied toward molded products such as paper, monofilament or multifilament fibers, knitted or woven fabric, nonwoven fabric, synthetic resin film, synthetic resin molded product, glass molded product, ceramics molded product, leather molded product, metal molded product, wood molded product or the like by a printing method such as a gravure, offset, screen or tampo printings, or by a coating method such as a brush painting, hazing painting, dipping, roll coating, knife coating, shower coating or spray coating" (Column 6, lines 42-57).

Therefore, in view of the teachings of the tertiary reference, one of ordinary skill in the art would have been motivated to modify the primary reference by using the water resistant luminous pigment of Kitagawa in the liquid level detecting mechanism of Ebinuma. The motivation for doing so would have been "it is a luminous pigment able to emit light in a dark place for long time and also has a very excellent water resistance" (Column 6, lines 36-38).

3. Claims 7, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebinuma et al. (US 4,610,202) in view of Chuang et al. (US 5,708,957).

With respect to claim 7, the primary reference of Ebinuma discloses an inkjet printer (Fig. 1) comprising an ink level-detecting device (Fig. 3), the inkjet printer comprising:

- a photo detector (Fig. 3, element 38, i.e. photocoupler); and

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- an ink level detecting device (Fig. 3, element 38) detecting an amount of residual ink in the printer using the photo detector (Column 3, lines 50-53), and comprising a luminous member (Fig. 3, element 38, Column 3, lines 31-32) to detect when a level of ink is lower than a predetermined level during a printing operation,

wherein the ink level detecting device comprises:

- an ink tank (Fig. 3, element 30) comprising a liquid carrier and a toner used as a developer for the inkjet printer (Fig. 1),
- an inwardly protruding (Fig. 3B) supporting member (Fig. 2, element 36) disposed at a surface (Column 3, lines 36-39, i.e. outer walls) of the ink tank to detect when the ink is low,
- a transparent window (Fig. 3, element 37) passing a light from the luminous member and disposed at another surface of the ink tank, and
- a photo detector detecting the light from the luminous member (Column 3, lines 36-49).

With respect to claim 11, the primary reference of Ebinuma discloses "A pair of sensors, for example, electrodes 38 are arranged to face each other on the outer walls of the projection. By detecting an electrostatic capacitance between the electrodes, a level of the ink in the first tank 30 or the presence or absence of the ink is detected. When the projection 37 is made of a transparent material, the sensor may be a photocoupler." (Column 3, lines 26-32). Applicant's claimed invention specifies that

when the container is not empty, the sensor cannot detect any light passing through the ink. Therefore, Ebinuma renders obvious the claimed invention.

With respect to claim 12, the primary reference of Ebinuma discloses when the tank is not full, the ink level is under the transparent window and the light emitted from the luminous member passes through the transparent window (Column 3, lines 26-32).

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebinuma et al. (US 4,610,202) in view of Chuang et al. (US 5,708,957) as applied to claims 7 and 10-13 above, and further in view of Denton et al. (US 6,293,143 B1).

Ebinuma and Chuang references disclose all of the limitations of the ink-detecting device of an inkjet printer except:

- a controller controlling operations of the inkjet printer and outputting a signal indicative that the level of ink is lower than the predetermined level to an output device and
- the output device comprises a display.

Denton discloses, "a digital signal is generated as a result of the output change and is relayed to the printer control to signal a low ink level alarm. The alarm may be an audible signal, a visible signal, a message displayed on a computer monitor or a combination of signals and/or messages. In the alternative, the digital signal generated by the photo sensor 38 may also be used to terminate printing operations upon activation of the low level alarm" (column 4, lines 56-65).

Therefore, in view of the teachings of the tertiary reference, one of ordinary skill in the art would have been motivated to modify the primary reference by using the display

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indications for low ink level of Denton in the liquid level detecting mechanism of Ebinuma. The motivation for doing so would have been to easily alert a user of the printer when the liquid level within the ink tank is low.

Response to Arguments

Applicant's arguments with respect to claims 1-9, 11, and 12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


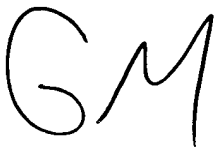
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is 571 272-2810. The examiner can normally be reached on 7am - 330pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GSM
6/14/2006



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